

# The Impact of the Sea-level Rise in the Hydromorphology of Alluvial Rivers

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## Abstract

Today, there is a special concern about the impact of the expected sea-level rise in hydrodynamic patterns of fluvial systems. In this study, the effects of sea-level rise in the sediment transport of alluvial rivers is analysed taking as an example the largest river located exclusively in the Portuguese territory, the Mondego river, specifically its lower reach from Coimbra to the river's mouth in the Atlantic ocean [1, 2]. The Mondego river basin has a catchment area of  $8640 \text{ km}^2$  and a significant soil erosion and sediment yield. Numerical results are obtained by an aggradation-degradation numerical model that uses the Engelund-Hansen formula for the sediment transport [3]. For the present work, two scenarios of river discharge are considered: the theoretical dominant discharge ( $Q_{dom} = 340 \text{ m}^3/\text{s}$ ) and a series of monthly discharges estimated for the period from 2014 to 2100. According to previous studies, a sediment discharge of  $3 \text{ l/s}$  is considered as an upstream boundary condition. Whereas for the sea level rise, three scenarios are taken into account for the time period that goes from 2014 to 2100, namely  $3,2 \text{ mm/year}$ ,  $4,8 \text{ mm/year}$  and  $12 \text{ mm/year}$  [4].

**Keywords:** : sea-level rise; aggradation-degradation; Engelund-Hansen formula; sediment discharge; alluvial river; Mondego river.

## References

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